



**The Development of Local Watermen Oyster Aquaculture Businesses:
A Co-Management Business Model for Maryland's Oyster Industry**

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October 2007

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Background

Over the years, oyster abundance has declined to record lows. State-wide, harvests which exceeded 15 million bushels in the late 1800's and sustained an average of 2 to 3 million bushels through much of the mid 20th century, dropped to 26,495 bushels in 2004¹. Reasons for this decline have been identified as heavy harvest pressure, land based pollution and two parasitic diseases – Dermo (caused by *Perkinsus marinus*) and MSX (caused by *Haplosporidium nelsoni*). These decreases have made a significant impact on Maryland's seafood industry as well as the health of the Chesapeake Bay.

In order to prevent complete economic collapse of local watermen communities around the Chesapeake Bay, we believe that the industry needs to develop businesses that increase involvement in the oyster production process and provides a more stable and predictable flow of oyster resources. One way to get the industry more involved in the production process is through the development of individual aquaculture businesses. These businesses include activities such as local hatcheries and grow out operations. The capability of producing marketable oysters enables the industry to be co-managers of the oyster resource. The industry will have a more predictable supply of oysters while the State continues to work toward restoring the oyster population for its ecological benefit and contribution water quality. The predictable supply will enable watermen to exercise greater control in the marketplace and provide them with a more stable and predictable flow of revenue. As watermen are able to realize greater harvest, more will be attracted to re-enter the industry. More support industries will develop and the industry will grow which will inherently provide greater stability to the local community.

Project Overview

The overall goal of the project is to develop a model for a stable, sustainable oyster industry that supports regional watermen and their culture. This project will focus on: i) developing solutions to production and economic inefficiencies, ii) identifying product and market opportunities, and iii) investigating co-management models. It represents an integrated approach involving the Estuarine Research Center, and the Schools of Engineering and Business and Management at Morgan State University in collaboration with the Calvert County Watermen's Association. As a result of these efforts, it is anticipated that there will be an:

Increased supply of hatchery produced larvae and/or spat and
Increased industry profitability

Developing Solutions to Production and Economic Inefficiencies

One of the barriers to a sustainable business model is the industry's dependence on natural forces to provide oysters for harvesting. However, if there were a more dependable supply of oysters, the industry would be able to exert a greater influence on both oyster production and the market, while also contributing to the state's oyster restoration efforts. Hatchery raised product can be used as the first step toward generating a supply of marketable oysters. This project will look at the most efficient

and economic way to obtain and use larvae or spat as a source for growing marketable oysters.

There are two hatchery raised products that the industry could use to generate a supply of market oysters, one is the eyed larvae and the other is spat. The supply of eyed larvae or spat would be bought from existing hatcheries (if sufficient supply is available) or facilitated by the development of a local micro-hatchery. A pilot oyster hatchery will be developed at the Morgan State University Estuarine Research Center (ERC). This facility will be used to find ways to optimize the hatchery process to make it economical for the private sector to develop small scale, micro-hatcheries.

One of the major issues that affect the production of oysters is disease. Dermo and MSX are prevalent in Maryland waters and both are able to kill large numbers of oysters before they are able to grow to market size. A possible defense against the lethal effects of disease is the use of triploid oysters. Since these are non-reproducing oysters, most of their energy goes to year-round growth resulting in market size oysters in less than the normal three years. The extent to which this produces marketable oysters before either of the two diseases can kill the stock will be explored.

Identifying Product and Market Opportunities

Traditionally, watermen would sell their catch to a local processing house or to a buyer that would then sell whole oysters to wholesale and institutional markets. Occasionally, watermen would sell directly to a restaurant or road-side to the general public. As the resource declined, these traditional established avenues of marketing have begun to disappear. Oysters from outside of the Chesapeake Bay region (Florida and Texas for example) are being brought in and sold in Maryland markets. The feasibility of buying larvae or spat and growing oysters to market size will depend upon how well these products can compete with the imported products and what would be the expected price received for the local products. To address these questions will require an analysis of the present market, including a review of current prices, sources of product and consumer demand. Based upon the market analysis, a business plan for the watermen would need to be developed.

Investigating Co-Management Models

Maryland watermen presently operate under a hunter-gatherer businesses model. They use historic, inefficient methods to harvest the few oysters resulting from natural or management actions. State resource managers establish the rules governing how and when oysters can be harvested, while dockside price is set by the remaining few buyers. As such watermen exert limited control on only a small portion of the industry. However, by becoming more engaged in the production process, they can exert a role as co-manager of the oyster resource. As co-managers, watermen have a greater voice in the decision making process related to their oysters as they seek to ensure more appropriate, more efficient and more equitable management². If watermen are to successfully participate in the production of oysters, they will have to consider alternative business models or organizational structures. We are exploring what models the waterman can use as examples and how they should organize themselves to make the most efficient use of new production capabilities and their role in the production.

Work Plan

We have developed a four-phased study approach that directs our efforts thru the implementation stage. The work effort associated with each phase is outlined below:

Phase 1: As-Is Assessment

This is an evaluation of the current status of Maryland's oyster industry utilizing the existing body of information and augmenting it with interviews and site visits as necessary to characterize the present status of the industry. It will also look at the existing economics of the industry by conducting a regional economic assessment using IMPLAN (a regional economic Input-Output assessment model).

Phase 2: Determination of Business and Engineering Models

This phase uses the As-Is assessment to characterize the present business model for the oyster industry and to develop an industrial process model representing the oyster industry. To augment the As-Is Assessment, we will conduct a study to determine the feasibility of developing an oyster hatchery. With funding from USDA, we are working with a private consultant and Morgan's School of Business and Management's Entrepreneurial Development and Assistance Center who are conducting a feasibility study intended to answer the following questions:

- * Could local watermen purchase hatchery raised product from existing facilities or is the development of a local hatchery the most economical approach?
- * What hatchery product(s) should be considered for use by watermen and what is the most feasible way to grow it/them to market products?
- * What organizational structure model would be most appropriate to help achieve sustainability and profitability for the watermen?

Phase 3: Optimization

A micro scale working oyster hatchery will be developed at the Estuarine Research Center facility. The hatchery will utilize native oysters and have the capability of producing both larvae and spat. These products will be used to assist members of the Calvert County Watermen's Association to develop remote setting or growout operations. These operations will allow the watermen to utilize products from the hatchery to help them produce a supply stream of marketable oysters.

Phase 4: Deployment

The final phase will involve transitioning the operational processes of the hatchery developed at the ERC to the industry. This will involve the development of funding opportunities (such as a revolving loan fund) to assist the industry in the adoption of this new technology.

Timeline:

Activity	Periods							
	Spr 07	Sum 07	Fall 07	Spr 08	Sum 08	Fall 08	Spr 09	Sum 09
As-Is Assessment								
Determination of Business Model								
Optimization								
Deployment								

¹ Maryland Department of Natural Resources, 2006

² Pinkerton, Evelyn. 1989. Co-Operative Management of Local Fisheries. University of British Columbia Press. Vancouver, BC.